PORTABLE DISPLAY DEVICE WITH AT LEAST TWO DISPLAY SCREENS CONTROLLABLE COLLECTIVELY OR SEPARATELY

This application is a continuation of application Ser. No. 08/113,637, filed Aug. 31, 1993, now abandoned.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a display device for displaying documents containing text and other data for the sake of reading of the documents.

2. Description of the Background Art

A conventional portable computer device has been equipped with a display facility comprising a single display screen. In this conventional display facility, when a long text which cannot be contained entirely within this single display screen is to be read, it has been necessary to use the scroll function such that the displayed portion can be shifted sequentially.

Now, when there is a figure in the document followed by a lengthy explanation of this figure, there is a possibility that the figure itself moves out of the display screen and therefore cannot be seen while a reader reads through this lengthy explanation. Similarly, when the explanation of the symbols to be used in the later parts of the document Is given collectively in an earlier part of the document, until the reader gets thoroughly familiar with the symbols, the reader must go back to the earlier part very frequently while reading the later parts.

In these circumstances, if the document is presented in a form of a book, the reader can mark the earlier part to be looked back easily by means of a finger or a bookmarker, so that the reader can go back and forth between the earlier part and the presently reading part very easily. However, in a case of an electronic display device such as that provided on a conventional portable computer device, it is quite cumbersome to switch the displayed pages frequently, and in addition it is difficult to read smoothly as the earlier part and the presently reading part cannot be seen simultaneously.

This difficulty can be resolves by using the multi-window function, such that two different parts of the document can be displayed simultaneously in two different windows. Here, the multi-window function can be furnished either by dividing the display screen or by allowing an overlap of one window over another.

In a case of dividing the display screen, the displayed content of each window remains entirely visible within each window so that the problem concerning the impossibility of the simultaneous display of two different parts can be resolved, but because the display screen itself has a limited size especially in a portable computer device, the amount of data that can be presented in each window at any one moment is rather limited, such that the overview of the entire document is hard to comprehend and it actually requires a longer time to read the document.

On the other hand, in a case of using a plurality of windows in overlap, when the amount of data that can be presented in one window is increased, the overlapped portion becomes large and the displayed content of the overlapped window becomes invisible, so that the problem concerning the impossibility of the simultaneous display of two different parts cannot be resolved.

Moreover, in either case, the reader is required to carry out the manipulations of the windows, which can be quite cumbersome.

SUMMARY OF THE INVENTION

It is therefore an object of the present invention to provide a portable display device capable of presenting a document in an easy to read format, in which a simultaneous display of different parts of the document in reasonable sizes can be made, by a simple operation of the device.

This object is achieved in the present invention by providing a display device, comprising: document memory means for storing documents to be displayed; at least two display screens for displaying the documents stored in the document memory means; and display control means for controlling displays of the documents on the display screens to be in a linked mode in which the displays on the display screens are linked together and in a separate mode in which the displays on the display screens are independent from each other.

Other features and advantages of the present invention will become apparent from the following description taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a schematic perspective view of one embodiment of a portable display device according to the present invention.

FIG. **2**A is a perspective view of the display device of FIG. **1** in a state of folding the display screens face to face.

FIG. **2**B is a perspective view of the display device of FIG. **1** in a state of folding the display screens back to back.

FIG. **3** is a schematic block diagram of the display device of FIG. **1**.

FIG. **4** is an illustration of a basic function menu used in the display device of FIG. **1**.

FIG. **5** is an illustration of a page menu used in the display device of FIG. **1**.

FIG. **6** is an illustration of page manipulation mode selection icons and linked page switching mode selection sub-menu.

FIGS. **7**A and **7**B are sequential illustrations of both sides switching mode and one side switching mode in the display device of FIG. **1**.

FIGS. **8**A, **8**B, and **8**C are illustrations of various displays in the linked mode in the display device of FIG. **1**.

FIG. **9** is a flow chart for a border treatment operation in a case of a wide display function in the display device of FIG. **1**.

FIGS. **10**A and **10**B are illustrations of two displays in the wide display function requiring the border treatment operation in the display device of FIG. **1**

FIGS. **10**C and **10**D are illustrations of a display in the wide display function before and after the border treatment operation in the display device of FIG. **1**

FIG. **11** is an illustration of various external devices connected with the display device of FIG. **1**.

FIG. **12** is a flow chart for a secret protection operation at a time of transferring of the document in the display device of FIG. **1**.

FIG. **13** is a flow chart for a secret protection operation at a time of displaying of the document in the display device